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The Nature and Correlates of Sibling Influence in Two-Parent African American Families

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Abstract

Guided by research and theory on sibling similarities and differences, this study explored the nature and correlates of two processes of sibling influence—social learning and sibling differentiation—during adolescence. Participants included two adolescent-aged siblings ($M = 16.29$ years for older siblings and $M = 12.59$ years for younger siblings, respectively) from 166 two-parent African American families. Significant nonlinear associations between these two influence dynamics and some sibling relationship qualities were discovered. For sibling differentiation, but not social learning, these links were further moderated by sex composition of the sibling dyad. Additional analyses revealed that youths' reports of social learning were generally linked to smaller differences between siblings, whereas differentiation processes were linked to greater differences in siblings' individual characteristics.

Keywords

African Americans; Relationship Processes; Sibling Relations; Child Siblings

A growing body of research documents that siblings can influence one another in a variety of ways, producing both similarities and differences between brothers and sisters (e.g., Brody & Murry, 2001; Whiteman, McHale, & Crouter, 2007a). The goal of this paper was to explore the nature and correlates of two key influence processes—social learning and sibling differentiation—in a sample of African American sibling dyads. Understanding the processes that foster siblings' similarities and differences is important for both researchers and practitioners as knowledge about such mechanisms can provide new targets for family-based intervention programs aimed at promoting positive or curbing negative sibling influences.

Processes of Sibling Influence: Social Learning and Sibling Differentiation

Social Learning

Social learning processes including modeling and reinforcement are commonly cited as reasons why brothers and sisters often share interests, attributes, and behaviors (e.g., D'Amico & Fromme, 1997; Slomkowski, Rende, Conger, Simons, & Conger, 2001). Social

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learning theories suggest that youth acquire new attitudes, behaviors, and skills through observation and social reinforcement. Within the family context, older siblings may be especially powerful influences because they may possess three characteristics of effective socialization agents: status, nurturance, and similarity (Mischel, 1966). First, given that they are older and likely more skilled in a variety of domains, older siblings may be perceived as high in status by younger brothers and sisters. As such, older siblings are more likely to be imitated by younger siblings than vice versa and the effects of social reinforcement may be especially strong. Second, given their roles as leaders, caregivers, and sources of advice and support, older siblings also may be perceived as warm and nurturing. Finally, research and theory suggests that models who are similar to the self are more likely to be imitated. Shared family heritage and experiences mean that siblings are salient models; some siblings, however, may be more powerful socialization agents than others. For example, some studies document stronger correlations between the characteristics of same-sex siblings as compared to characteristics of brothers and sisters (e.g., McHale, Bissell, & Kim, 2009; Rowe & Gulley, 1992; Slomkowski et al., 2001).

Consistent with social learning predictions, similarities between adolescent-age siblings' characteristics have emerged in a variety of domains including: health risk behaviors (D'Amico & Fromme, 1997); smoking, alcohol, and drug use (e.g., Fagan & Najman, 2005; Slomkowski, Rende, Novak, Lloyd-Richardson, & Niaura, 2005); aggression and delinquency (e.g., Patterson, 1984; Slomkowski et al., 2001); and risky sexual behavior and teen pregnancy (e.g., East, 1998; McHale et al., 2009; Rodgers, Rowe, & Harris, 1992). In addition, siblings are similar in positive qualities such as empathy (Tucker, Updegraff, McHale, & Crouter, 1999), gendered ideologies (McHale, Updegraff, Helms-Erikson, & Crouter, 2001), athletic and academic interests and activities (Whiteman et al., 2007a; 2007b), as well as social competencies (Stormshak, Bellanti, Bierman, et al., 1996). Behavior genetic investigations show that such sibling effects emerge even after accounting for the contributions of shared genetics and parenting (McGue, Sharma, & Benson 1996; Rende, Slomkowski, Lloyd-Richardson, & Niaura, 2005; Slomkowski et al., 2005). In short, siblings, especially older siblings, may make unique contributions to their brothers' and sisters' developing attitudes and behaviors.

Yet, with a few exceptions (e.g., Patterson, 1984; Whiteman et al., 2007a; 2007b), most previous studies of sibling influence have posited social learning as a *post hoc* explanation for sibling similarities. For example, consistent with the hypothesis that individuals are most likely to imitate warm and nurturing models, Slomkowski et al. (2005) and Rende et al. (2005) found that older siblings' substance use was linked to younger siblings' use, but that this link was stronger in the context of a close sibling relationship. By highlighting some of the dynamics underlying sibling similarities, findings like these provide a foundation for inferences about the role of social learning processes in explaining sibling similarities. The present study advances this work by directly assessing the extent to which younger siblings report modeling and social reinforcement vis-à-vis their older sisters and brothers and connecting those social learning processes to similarities between siblings' individual characteristics.

Sibling Differentiation

Although most developmental research highlights similarities between siblings, differences between siblings are also prevalent. For example, behavioral genetic investigations reveal that in areas such as intelligence, personality, and adjustment, siblings are often no more similar than unrelated youth (e.g., Dunn & Plomin, 1990; Plomin & Daniels, 1987). From a behavioral genetics' perspective, sibling differences are the result of nonshared genes and environments. Differences may also arise, however, as the result of siblings consciously or unconsciously differentiating from one another—a dynamic first described by Alfred Adler

(Ansbacher & Ansbacher, 1956) and termed sibling deidentification. By choosing different niches and developing distinct personal qualities, siblings protect themselves from social comparison, envy, and rivalry (e.g., Feinberg & Hetherington, 2000; Festinger, 1954; Schachter, Shore, Feldman-Rotman, Marquis, & Campbell 1976; Tesser, 1980; see also Sulloway, 1996). Furthermore, by reducing sibling rivalry and competition, deidentification dynamics may improve sibling relationships. Similarly to social learning theory, differentiation processes are hypothesized to be stronger when siblings are more similar, such as when they are closer in age or of the same sex (Schachter et al., 1976).

A small body of work documents differentiation dynamics in adolescent sibling relationships. For example, supporting the idea that siblings close in age should differentiate, Schachter and colleagues (1976) reported that consecutively-born siblings were more different in their personality qualities than jump-pairs. In a nationally representative sample, Feinberg and Hetherington (2000) found that, with a few exceptions, siblings closer in age were less similar (or more different) across a range of adjustment indices than those further apart in age. Consistent with a sibling differentiation model Grotevant (1978) found that adolescent girls with sisters reported fewer stereotypically feminine vocational interests than did girls with brothers. In a sample of college-aged men, Leventhal (1970) found that younger brothers reported more stereotypically masculine vocational and activity interests when they had older sisters as opposed to older brothers. Finally, studying siblings' gender ideologies, McHale et al. (2001) found that firstborn adolescent-age siblings became more different from their younger siblings over time. In the face of these results, sibling differentiation has been invoked as a *post hoc* explanation for differences between siblings, but again, influence processes have not been measured directly.

The Present Study

Our first goal was to develop a measure of sibling influences that could be used to predict similarities and differences between siblings. To our knowledge, only one previous study has assessed siblings' reports of social learning and differentiation (Whiteman, McHale, & Crouter, 2007). Taking a person-centered approach and studying 171 European American dyads, findings revealed that 43% of sibling dyads were characterized by social learning dynamics and 27% of dyads were characterized by differentiation dynamics (the remaining 30% of dyads reported low levels of both influence processes). Younger siblings were asked how often they tried to be both like and different from their older siblings in particular domains (i.e., athletics, arts, academics, and conduct problems), and the findings revealed consistency across domains, implying that social learning and differentiation processes can be captured at a global level. Therefore, for this study, we created an 18-item scale that was designed to assess younger siblings' global reports of their efforts to be like and/or to differentiate from their older brothers and sisters.

Given research and theory on sibling influences suggesting that social learning and differentiation are linked to both structural (i.e., dyad sex constellation and age spacing) and affective dimensions of the sibling relationship, our second goal was to connect sibling influence processes to sibling relationship qualities. On one hand, social learning processes should be more apparent in same-sex dyads and in dyads with warmer relationships (e.g., Rowe & Gulley, 1992; Slomkowski et al., 2001; 2005). Sibling differentiation models, in contrast, posit that differentiation should be more apparent in same-sex dyads and that it should improve relationship quality by reducing competition and rivalry. We tested these competing hypotheses by exploring the correlates of social learning and differentiation processes.

Findings on the links between differentiation and sibling relationship qualities are also mixed. For example, Feinberg, McHale, Crouter, and Cumsille (2003) found that siblings who became more different in their relationships with their parents over time also became more positive in their relationships with one another. In contrast, our previous work revealed that siblings' reports of differentiation were linked to greater conflict and less warmth between siblings (Whiteman et al., 2007a). One explanation for these inconsistencies is that influence dynamics are related to sibling relationship qualities in a nonlinear way. Thus, a low to moderate level of differentiation may reduce competition and rivalry while maintaining warmth. High levels of differentiation, however, may mark relationships with very low levels of involvement or high levels of conflict. In this study, we explored whether youths' reports of social learning and differentiation were related in both linear and nonlinear ways to sibling relationship qualities, including positivity, negativity, and temporal involvement. Given the idea from both social learning and deidentification theories, that influence dynamics are more prevalent in same-versus mixed-sex dyads, we also tested whether the sex composition of the sibling dyad (same versus mixed) moderated the links between influence processes and relationship qualities.

Our earlier work revealed that siblings' reports of social learning and differentiation were connected to similarities and differences between their involvement in extracurricular activities, school performance, and behavior (Whiteman et al., 2007a): Younger siblings who endorsed social learning processes were generally more similar to their older brothers and sisters than those who endorsed differentiation processes. Following on this work, our third goal was to examine the links between sibling influence processes and similarities and differences between siblings' individual characteristics. We expanded on our earlier work to examine indicators of siblings' similarity in risky behaviors, attitudes towards substance use, academic orientations, and general social competence.

Finally, we focused on a sample of African American adolescent-age siblings. To date, most research on siblings relies on European American samples, and very few studies have examined the nature and correlates of sibling relationships in African American families. This oversight is surprising given demographic data documenting that the families of minority youth include more siblings than European American families (US Census Bureau, 1993) and research showing that kin relationships are salient in African American families and important for youth adjustment (e.g., Brody & Murry, 2001; McHale, Whiteman, Kim, & Crouter, 2007; Stormshak, Comeau, Shepard, 2004). Older brothers and sisters may be especially important sources of influence in African American families given cultural histories that proscribe caregiving and other socialization roles for older siblings (e.g., Brody & Murry, 2001; Young, 1974). Thus, an important contribution of this study was to examine normative sibling influences and relationships in African American families.

Method

Participants

Data were drawn from 166 families who were participating in a short-term longitudinal study of African American families. We used Year 3 (the last year of the study) data because measures central to the current study were collected then. Given the goals of the larger study, we did not seek a representative sample. Instead, we sought families who self-identified as being African American or Black and included both a mother and father who were living together and rearing at least two offspring in middle childhood and adolescence.

To generate the sample, we targeted two contiguous urban centers on the Eastern Seaboard with substantial African American populations. Families were recruited using two strategies. First, we hired African Americans residing in the targeted communities to recruit families by

providing information about the study to local churches and community groups as well as distribute flyers at youth activities. Interested families then contacted local recruiters, who in turn passed on their names to the project office. Approximately half of the sample was recruited using this procedure. Second, we purchased a marketing list that included names and addresses of African American students in Grades 4 through 7 who lived in the same geographic region. We sent letters that described the study, and interested families either called an 800 number or returned a postcard (for more details about the recruitment procedure see McHale et al., 2006). Families self-identified as African American/Black; among participating families, all target siblings, 97.59% of fathers, and 93.37% of mothers reported that they were African American/Black and there was no family in which neither parent was African American.

Family socioeconomic circumstances varied from working to middle and upper middle class as indexed by parent education, occupational status and income. On average, parents had completed some college ($M = 14.44$, $SD = 2.22$ for fathers and $M = 14.86$, $SD = 1.81$ for mothers; 12 = high school graduate, 16 = college graduate). In terms of job prestige, assessed using the National Opinion Research Council's codes (Nakao & Treas, 1994), fathers' job prestige averaged 49.52 ($SD = 13.11$) and mothers' averaged 50.10 ($SD = 11.89$), with jobs in this range including teacher's aide, real estate agent, and sheriff/law enforcement officer. Mean family income was relatively high ($M = \$97,152$, $SD = \$76,291$), likely due to the fact that our sample was comprised of two-parent families with adolescent-age children (with older parents in the labor force for more time), and primarily two employed parents (91% of fathers and 82% of mothers were employed). Importantly the median income for sample families ($Mdn = \$83,620$) fell in the range of the median incomes of two-earner families from the two states in which these data were collected (\$98,163 and \$74,884, respectively; US Census Bureau, 2007).

The majority of families (80%) included two or three children ($M = 2.61$, $SD = 1.32$, $range = 2 - 8$ children). In families with more than two children, we sampled two consecutively born siblings. At Year 3, older siblings averaged 16.29 ($SD = 1.85$, $range = 13.08 - 21.02$) and younger siblings, 12.59 ($SD = 1.12$, $range = 9.87 - 15.23$) years of age. On average, older siblings were 3.70 ($SD = 1.93$, $range = 0.96 - 9.36$) years older than younger siblings. By Year 3, 15 older siblings had moved out of their parents' home. The sample included (44 sister-sister pairs, 38 sister-brother pairs, 44 brother-sister pairs, and 40 brother-brother pairs). Further, 92% of siblings were biologically related to mothers, 75% were biologically related to fathers, 74% were related biologically related to both parents, and 80% of dyads were full biological siblings.

Procedure

Two data collection procedures were used. First, mothers, fathers, and the two target siblings were interviewed in their homes by a team of two interviewers, almost all of whom were African American. The interviews began with a description of the study and review of informed consent-assent procedures. After each family member provided informed consent/assent, they were interviewed individually about their family relationships and individual well-being using a variety of procedures, including card sorts, response cards, and questionnaires. Parent interviews lasted approximately 2 hours and youth interviews lasted about 1 hour.

During the 2 - 4 week period following the home interviews, daily time use data were collected during a series of 7 evening telephone interviews (5 calls on weekdays, 2 calls on weekends). Both siblings participated in all 7 calls, and mothers and fathers each completed 4 calls (i.e., on 3 week nights and 1 weekend night, for each parent). These calls were designed to gather information about siblings' daily home and personal activities (i.e.,

excluding school activities). Using a cued-recall strategy, each sibling reported his/her involvement in 84 daily activities (e.g., wash dishes, watch TV) including how long each activity lasted and who else participated (e.g., siblings, parents, friends). Families received a \$300 honorarium.

Measures

Background information including parents' education, income, job prestige, family size, and offspring age and gender), were obtained from parents at the start of the home interview.

Processes of sibling influence were assessed in the home interviews via younger siblings' reports on an 18-item measure designed for this study. Specifically, on a scale ranging from 1 (*never*) to 5 (*very often*), youth answered questions about how much they tried to be like and/or different from their older sibling, the degree to which their older sibling set a positive and/or negative example, and the extent to which their sibling encouraged them to participate in particular activities (see Table 1 for the list of items).

Sibling relationship qualities were indexed in terms of positivity, negativity, and temporal involvement. Positivity and negativity were rated by younger siblings on a 5 point scale (1 = *never or hardly ever*, 5 = *always*), using 12 items from Stocker and McHale's (1992) Sibling Relationship Inventory. Positivity was indexed using 7 items, including: "How often do you do nice things like helping or doing favors for your sister/brother? Negativity was indexed using 5 items such as: "How often does your sister/brother get mad at or angry with you?" Scores were created by averaging items for each scale, and total scores could range from 1 to 5 ($M = 2.92$, $SD = 0.72$, Cronbach's $\alpha = .79$ for positivity and $M = 2.62$, $SD = 1.01$, Cronbach's $\alpha = .85$ as for negativity).

Siblings' dyadic involvement, or time spent in shared activities, was assessed using data collected in the telephone interviews. Aggregating youths' reports across the 7 phone calls, siblings' temporal involvement was measured by the total number of minutes siblings participated in activities together. Higher scores represent more time (in minutes) spent together across the 7 days. Because both siblings reported on time spent together and because the correlation between the reports was high, $r = .90$, $p < .01$, we used the average of older and younger siblings' reports of time spent together ($M = 472.18$, $SD = 372.62$ minutes/7 days).

Youths' individual characteristics were indexed in terms of risky behaviors, attitudes towards substance use; academic orientations; and social competence. Risky behaviors were measured via Eccles and Barber's (1990) 18-item index of youths' participation in behaviors such as "Do something you knew was dangerous just for the thrill of it." Youth used a scale of 1 (*never*) to 4 (*more than 10 times*), and scores were summed, with higher scores indicating greater participation. Total scores could range from 18 to 72 ($M = 26.52$, $SD = 7.28$, Cronbach's $\alpha = .86$ for older siblings; $M = 23.24$, $SD = 5.01$, Cronbach's $\alpha = .79$ for younger siblings). Older and younger siblings' reports of risky behavior were correlated, $r = .20$, $p < .05$.

We assessed youths' opinions about smoking and drinking using a 14-item measure from Elliott, Huizinga, and Ageton (1985). On a 1 (*strongly agree*) to 5 (*strongly disagree*) scale, youth rated their agreement with the same 7 statements about smoking and drinking, such as "Smoking/Drinking helps people relax," and "Smoking/Drinking makes life more exciting." Ratings were reversed scored and summed with higher scores indicating more risky attitudes. Total scores could range from 7 to 35 for both scales ($M = 13.86$, $SD = 7.44$, $M = 15.75$, $SD = 7.76$, Cronbach's $\alpha = .93$ for older siblings' attitudes about smoking and drinking, respectively; $M = 12.02$, $SD = 7.78$, $M = 12.24$, $SD = 7.72$, Cronbach's $\alpha = .97$ for

younger siblings' attitudes about smoking and drinking, respectively). Overall, youths' attitudes towards smoking and drinking were correlated ($r = .82, p < .01$ for older siblings; $r = .93, p < .01$ for younger siblings), however, older and younger siblings' reports were not correlated, $r = .04, ns$, and $r = .06, ns$ for attitudes about smoking and drinking, respectively.

Youths' academic orientations were indexed using two scales. First, school bonding was assessed using 6 items adapted from the National Longitudinal Study of Adolescent Health (Harris, 2008). On a scale of 1 (*strongly disagree*) to 5 (*strongly agree*), youth rated how much they agreed with statements such as: "You feel close to people at your school." Scores were summed, with higher scores reflecting greater school bonding. Total scores could range from 6 to 30 ($M = 22.12, SD = 4.31$ Cronbach's $\alpha = .75$ for older siblings; $M = 23.19, SD = 3.62$ Cronbach's $\alpha = .63$ for younger siblings). Older and younger siblings' reports of school bonding were correlated, $r = .21, p < .01$. Second, commitment to learning was assessed using a 7-item subscale from the Developmental Assets Profile (DAP; Search Institute, 2001). Youth used a scale of 1 (*not true*) to 3 (*very or often true*) to describe themselves on items such as: "I am eager to do well in school and other activities." Scores were created by averaging across items and multiplying by a constant of 10. Thus, total scores could range from 10 to 30 with higher scores denoting greater commitment to learning ($M = 25.56, SD = 3.13$, Cronbach's $\alpha = .69$ for older siblings; $M = 26.28, SD = 3.55$, Cronbach's $\alpha = .78$ for younger siblings). The two siblings' reports of commitment to learning, $r = .18, p < .05$ were correlated, and youths' reports of bonding and commitment to learning were correlated, $r = .30, p < .01$, for older siblings; $r = .18, p < .05$, for younger siblings.

Finally, adolescents' social competence was assessed using an 8-item subscale from the DAP (Search Institute, 2001). Sample items included "I am sensitive to the needs and feelings of others." Scores were created by averaging the 8 items and multiplying by a constant of 10; total scores ranged from 10 to 30 with higher scores indicating greater social competence ($M = 24.11, SD = 3.16$, Cronbach's $\alpha = .67$ for older siblings; $M = 25.11, SD = 3.23$, Cronbach's $\alpha = .70$ for younger siblings). The two siblings' reports were correlated, $r = .26, p < .01$.

Results

Sibling Influence Processes

Our first study goal was to test our measure of sound learning and differentiation processes. Toward this end, we subjected the 18-item index to a principal axis factor analysis with oblique rotation. The factor analysis revealed two factors with eigenvalues greater than one. As shown in Table 1, the first factor was consistent with influence processes that promote sibling similarities, and as such, we labeled this factor, *social learning*. In contrast, the second factor was consistent with influence processes that foster sibling differences, and we labeled this factor, *sibling differentiation*. Scale scores were created by taking the average across items for each factor; thus, total scores ranged from 1 to 5 ($M = 3.19, SD = 0.95$ for social learning and $M = 3.42, SD = 0.71$ for differentiation). Both scales were normally distributed, internally consistent (Cronbach $\alpha = .90$ for social learning and Cronbach $\alpha = .85$ for differentiation), and they were not correlated with each other ($r = -.05, ns$).

Sibling Relationship Correlates of Sibling Influence Processes

The second goal was to examine the structural and relationship correlates of these two influence processes. With respect to the structural correlates, inconsistent with both social learning and deidentification theories, neither social learning nor differentiation influences were endorsed at higher levels by younger siblings from same-sex as opposed to mixed-sex

dyads ($t = 0.57$, *ns* for social learning and $t = 0.35$, *ns* for differentiation). Analysis revealed no gender differences ($t = 0.76$, *ns* for social learning and $t = 1.25$, *ns* for differentiation), no links to age spacing, $r = .04$, *ns*; $r = -.01$, *ns*, for social learning and differentiation, and no associations with residential status, $t = 1.35$, *ns* and $t = 1.02$, *ns*, for social learning and differentiation.

To examine whether and how siblings' reports of differentiation and social learning were linked to sibling relationship qualities, we conducted a series of hierarchical multiple regressions. In these models, we included squared terms of the differentiation and social learning indices to assess potential nonlinear associations between sibling influence processes and sibling relationship quality. Given that both differentiation and social learning are thought to occur with greater frequency in same-versus mixed-sex dyads, we also included a dummy code for dyad sex composition (0 = same-sex, 1 = mixed-sex) as a potential moderator of links. We controlled for parents' education (average of mothers' and fathers' education), parents' occupational prestige (average of mothers' and fathers' prestige), family income, older siblings' residential status (0 = live in parents' home; 1 = moved out), and dyad age spacing in all models. With the exception of dummy coded variables, all variables were centered at their means. We present results for differentiation and social learning influence separately.

Differentiation—Younger siblings' reports of differentiation were associated with sibling positivity in a nonlinear fashion (see Table 2). Specifically, Model 1 revealed a significant main effect for the differentiation squared term. This main effect, however, was qualified by a significant interaction with dyad sex constellation in Model 2. As can be seen in Figure 1, for same-sex dyads, younger siblings' reports of differentiation were negatively related to sibling positivity. For mixed-sex dyads, however, the pattern was more nuanced. When younger siblings reported very low or very high levels of differentiation (i.e., $\pm 2 SD$), sibling positivity was higher; average levels of differentiation, however, were associated with lower ratings of positivity.

With respect to sibling negativity, as can be seen on the right side of Table 2, Model 1 revealed a significant effect of the squared differentiation term. This main effect, however, was qualified by a significant differentiation squared X sex constellation interaction. This interaction revealed that for same-sex siblings, low to average levels of differentiation were related to lower levels of negativity, whereas high levels of differentiation were associated with greater sibling negativity (see Figure 2). For mixed-sex sibling dyads, however, a different pattern emerged: Very low and high levels of differentiation were associated with less negativity, whereas average levels of differentiation were associated with greater negativity (see Figure 2).

Finally, the models examining the connections between differentiation and siblings' temporal involvement also revealed a significant differentiation squared X sex constellation interaction (see Table 3). As can be seen in Figure 3, for same-sex siblings, greater differentiation was generally linked to more time spent together. For mixed-sex dyads, however, very low and high levels of differentiation were associated with more time spent together, whereas average levels of differentiation were linked to lower involvement.

Social Learning—In general, analyses revealed that younger siblings' reports of social learning were significantly associated with the overall relationship positivity and negativity. With respect to positivity, there were significant main effects for the social learning, $B = .52$, $SE = .06$, $p < .01$, $\beta = .65$, and social learning squared terms, $B = .15$, $SE = .04$, $p < .05$, $\beta = .25$. Specifically, the positive association between social learning and sibling positivity was stronger when youth reported higher levels of social learning. These hierarchical models did

not reveal that these effects were moderated by the sex constellation of the dyad. For negativity, the linear effect of social learning was significant, $B = -.45$, $SE = .09$, $p < .01$, $\beta = -.42$, indicating that youth who reported more reinforcement and modeling also reported less sibling negativity. Again, dyad sex constellation did not moderate this effect. Younger siblings' reports of social learning were not related to siblings' dyadic involvement.

Sibling Influence Processes and Sibling Similarities and Differences

To assess links between sibling influence processes and similarities/differences in siblings' individual characteristics, we first created a series of absolute difference scores for each measure of siblings' individual adjustment. Lower scores reflected smaller differences between siblings and higher scores reflected larger differences between siblings qualities, regardless of which sibling scored higher/lower on the scale. Then, Pearson correlations (r) were calculated, partialing out parents' education, parents' job prestige, and family income, to assess how youths' perceptions of social learning and differentiation were linked to sibling differences. Because differentiation processes should be linked to greater divergence between siblings' characteristics, we expected positive correlations between the differentiation scale and the sibling difference scores. In contrast, because social learning should be related to greater similarity between siblings, we expected negative associations between the social learning scale and the sibling difference scores.

Table 4 shows the correlations between the two sibling influence process measures and the absolute sibling difference scores. Consistent with our expectations, in all but one domain, younger siblings' reports of differentiation showed significant associations with sibling differences. In contrast, younger siblings' reports of social learning were associated with smaller sibling differences in risky behaviors, commitment to learning, and social competence. Although nonsignificant, the directions of all remaining correlations in Table 4 were consistent with our predictions.

Discussion

Guided by research and theory on social learning and sibling deidentification, we developed a measure that assessed social learning and differentiation processes. Results from a factor analysis revealed that our measure was best described by two distinct factors, one indicative of social learning and the other of differentiation. These two subscales were internally consistent and related to differences in siblings' individual characteristics in predicted ways. That is, with a few exceptions, social learning was predictive of smaller differences and differentiation was predictive of larger differences between siblings' personal qualities. Because previous work has largely invoked social learning and deidentification hypotheses as *post hoc* explanations for observed patterns of similarity and difference, this study adds to the literature on sibling influences by measuring potential processes of influence and by connecting them to differences between adolescent siblings. Additionally, the results highlight the need for researchers and practitioners to consider the multiple ways in which siblings influence one another. For example, the literature on adolescents' alcohol and substance use consistently highlights similarities between siblings' attitudes and substance use patterns, suggesting that older siblings' use will be positively related to younger siblings' attitudes and use (e.g., Fagan & Najman, 2005; Slomkowski et al., 2005). Our findings, however, highlight that some siblings differentiate from their older brothers and sisters, an important insight for parents as well as practitioners who design and implement family-based intervention and prevention programs aimed at curbing risky behaviors and attitudes.

Because both social learning and differentiation theories predict that influence processes are related to sibling relationship quality, we also explored how social learning and

differentiation were linked to siblings' reports of positivity, negativity, and temporal involvement. Furthermore, in an attempt to resolve inconsistent findings from previous work (e.g., Feinberg et al., 2003; Whiteman et al., 2007a) we explored whether these associations were nonlinear. We found that younger siblings' reports of social learning were linked to their ratings of positivity and negativity in the sibling relationship in a relatively straightforward pattern: Social learning was associated with more positivity, especially when this influence dynamic was at a high level. Social learning was also inversely related to younger siblings' reports of negativity. These findings are consistent with social learning theory and prior work documenting that sibling modeling and reinforcement are related to warmer and less conflictual relationships (Whiteman & Christiansen, 2008; Whiteman et al., 2007a; Whiteman et al., 2007b).

With respect to differentiation processes, our analyses revealed significant nonlinear associations with sibling relationship qualities, and these links were moderated by the sex constellation of the sibling dyad. In general, for mixed-sex dyads, average levels of differentiation were linked with poorer relationship qualities (less positivity, more negativity, and less temporal involvement). In contrast, more extreme levels of differentiation (both low and high) were associated with more positive and less negative relationships, as well as more time spent together. Because sibling differences in mixed-sex dyads are clear, trying to differentiate from an older brother or sister to a moderate degree may do little to help protect siblings from competition and rivalry, therefore, relationship qualities may be poorer. In contrast, a strong degree of differentiation may mitigate rivalry, and failure to differentiate may mean that objective sibling differences are sufficient to keep competition at a low level.

For same-sex sibling dyads, in contrast, younger siblings' reports of differentiation were generally linked with less positivity and greater negativity, yet more time spent together. These findings converge with our earlier work with European American dyads which suggested that differentiation was related to less warmth and greater conflict in sibling relationships; however, in our earlier study, patterns of association were not qualified by sex constellation. The findings were inconsistent with both differentiation theory and work by Feinberg and colleagues (2003) suggesting that greater differentiation was linked to more positive sibling relationship qualities. It could be that differentiation is a developmental phenomenon, and although differentiation at one point in time is linked to more negative relationships, differentiation allows relationships to become more positive over time. Clearly, longitudinal data are needed to thoroughly test this hypothesis. It also could be that youths' conscious reports of differentiation are linked to relationship qualities in different ways than are the unconscious processes that are also posited in differentiation theories. For instance, consistent with the findings here, youths' reports of social learning and differentiation may hinge on whether they like and even get along with their brother or sister. Less conscious processes such as emerging personality/temperament differences and niche picking, however, may be related to closer, more intimate sibling ties. Future work should explore the development and correlates of different types of differentiation processes.

Limitations

The present study was limited by several methodological shortcomings that restrict our conclusions. First, although our sample enabled us to examine the nature and correlates of sibling influence processes within an understudied population, our ethnic homogeneous design does not permit generalization to other racial and ethnic groups. As such, future work would benefit from the examination of these dynamics across a range of populations, such as Latino families where familism values may make sibling ties especially important (e.g., Updegraff, McHale, Whiteman, Thayer, & Delgado, 2005). Our sample was also restricted to two-parent, working to middle and upper middle class families, and it is unknown

whether the findings extend to youth from other family structures. Given the higher prevalence of single-parent African American families (US Census Bureau, 2005), it is important that future work examine how family structure relates to siblings' roles and influence. For example, as Brody and Murry (2001) highlighted, sibling influences may be more pronounced in some contexts than others, and in single-parent families in which parents' financial and social capital are limited, sibling socialization may be more prevalent.

Another limitation was our cross-sectional design, which meant we were unable to disentangle whether social learning and differentiation processes led to differences in siblings' behaviors and attitudes or the reverse. Longitudinal data are necessary to understand both the development and implications of these influence processes. Longitudinal data would also improve understanding about how modeling and differentiation processes relate to other sibling relationship qualities. Although differentiation is proposed as a developmental process, the implications of siblings' differentiation have rarely been studied longitudinally. The results of this study, along with other recent cross-sectional work (e.g., Whiteman et al., 2007a; Whiteman & Christiansen, 2008), highlight the possibility that less harmonious sibling relationships may predict siblings' reports of differentiation rather than the reverse. And, although proposed as independent processes, it is also important that future studies examine how social learning and differentiation dynamics operate in concert with one another. In this study, younger siblings' reports of social learning and differentiation influences were not correlated. It could be that adolescents try to be like their brothers and sisters in some ways and at some times, but not at other times and places.

Additionally, because our design was not genetically informed, we were unable to determine the extent to which sibling similarity was influenced by shared genetics. From a behavior genetics perspective, genetic similarity should lead to similarity in environments such as through evocative or niche picking processes (Scarr, 1992). Sibling social learning processes may be one set of mediators of the links between genotypic and phenotypic similarities between siblings. Unaccounted for in current behavior genetics research is that siblings' genetic similarity may also promote differentiation between siblings (Feinberg et al., 2003). As in other research on sibling influences, behavior genetics research would be enhanced by direct measurement of social influence processes.

There were also a few measurement limitations. First, the internal consistencies of three measures were somewhat low (.60 - .70). Second, because we only collected reports of influence from younger siblings, it is unknown as to whether these results extend to older siblings. Recent work by Whiteman and Christiansen (2008) suggests that the nature of sibling influence processes may be different for older siblings, i.e., that they differentiate from their younger brothers and sisters, but do not model their behaviors. Future studies should include reports of influence from both older and younger siblings. Finally, future studies would benefit from the inclusion of more than two siblings per family, so that hypotheses regarding birth order and sex constellation can be adequately tested.

Conclusion

The present study adds to the literature on sibling influences by exploring the nature and correlates of these processes in a sample of African American siblings. Scholars have argued that kin relationships in African American families are especially important (e.g., McHale et al., 2007; Stormshak et al., 2004), and previous research has documented the significance of sibling ties and socialization in African American families (e.g., Brody & Murry, 2001). Our findings converge with this work in showing that siblings are described as important sources of influence in African American families. Moreover, in taking a step toward measuring sibling influence processes more directly, our study highlights the sometimes complex

associations between influence dynamics, sibling relationship qualities, and similarities and differences in siblings' personal qualities. One reason why sibling influence processes may be difficult to document is that they operate at different intensities across dyads and their correlates may differ as a function of that intensity, as some of our nonlinear associations suggest. Future research should continue to examine the ways in which these influence processes operate and how they are connected to and potentially moderated by individual, family, and environmental contexts.

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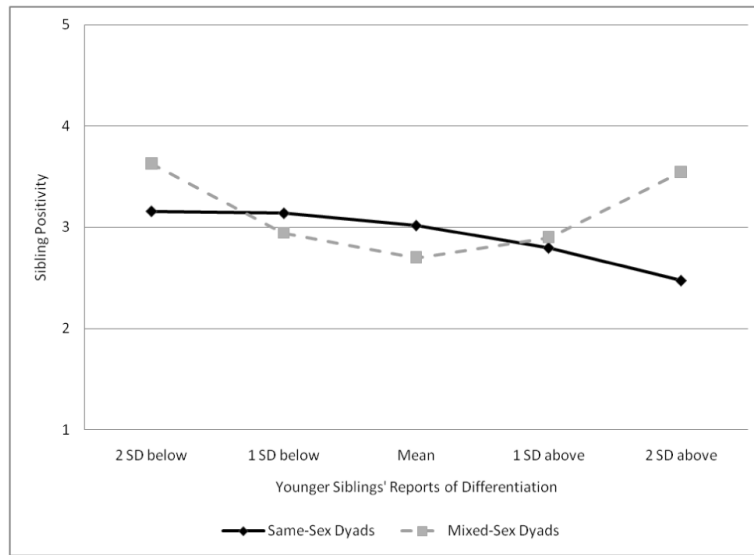


Figure 1. The nonlinear relation between sibling positivity and sibling differentiation as a function of the sex constellation of the sibling dyad.

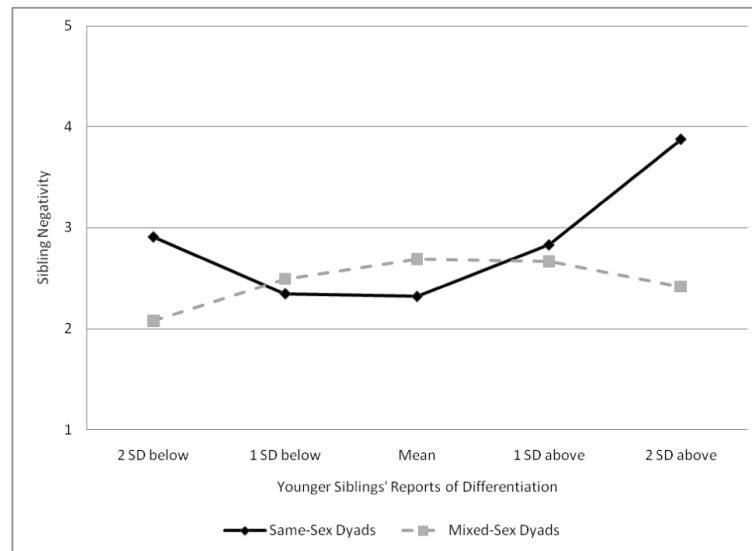


Figure 2. The nonlinear relation between sibling negativity and sibling differentiation as a function of the sex constellation of the sibling dyad.

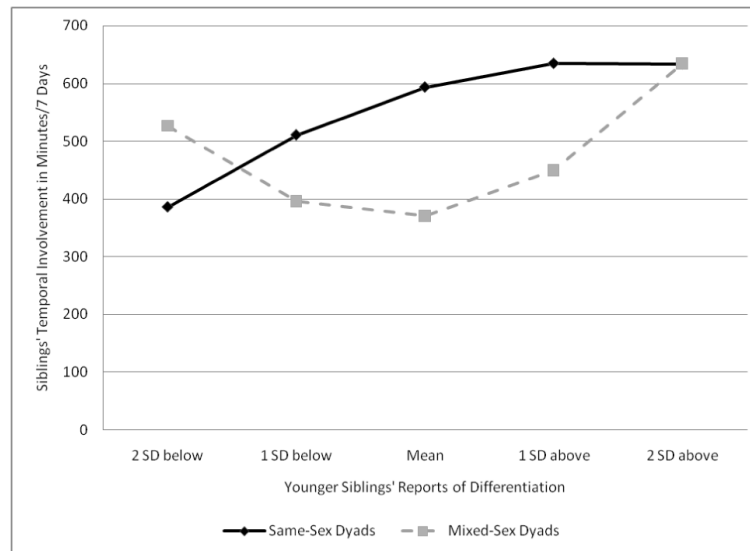


Figure 3. The nonlinear relation between siblings' temporal involvement and sibling differentiation as a function of the sex constellation of the sibling dyad.

Table 1
Items and Factor Loadings of the Sibling Influence Scale (N = 166)

Item	Factor Loadings	
	Social Learning	Differentiation
My sister/brother provides a model for how I should act.	.83	-.19
My sister/brother tells me how I should behave in a particular situation	.82	-.05
My sister/brother encourages me to get involved in particular activities	.79	-.02
My sister/brother sets an example for how to behave.	.79	-.09
My sister/brother gives me advice on how to behave.	.73	.01
From watching my sister/brother, I have learned how to do things.	.69	-.09
My sister/brother includes me in her/his activities away from home.	.67	.13
My sister/brother includes me in activities with her/his friends	.59	.17
I try to make different choices than my sister/brother.	-.09	.89
I try to be different from my sister/brother	-.05	.83
I want to be different from my sister/brother	-.15	.75
I live my life differently so I won't be like my sister/brother	-.09	.68
I want people to know that I am not the same as my sister/brother.	-.02	.66
After watching how my sister/brother is turning out, I plan to do things differently.	.21	.51
I've learned from my sister's/brother's mistakes.	.24	.44
I try to be good at things that my sister/brother isn't good at.	-.07	.43
It's hard to live up to my sister's/brother's example so I try to be different	.17	.42
My sister/brother sets a bad example for me.	-.25	.40

Note: Factor loadings greater than .40 appear in bold.

Table 2
Summary of Hierarchical Regression Models Predicting Sibling Positivity and Negativity as a Function of Sibling Differentiation Polynomials, Sex Constellation, and Differentiation X Sex Constellation Interactions (N = 152)

Variable	Sibling Positivity						Sibling Negativity					
	Model 1			Model 2			Model 1			Model 2		
	B	SEB	β	B	SEB	β	B	SEB	β	B	SEB	β
Intercept	2.89**	.09		3.02**	.09		2.49**	.12		2.32**	.13	
Parents' education	-.11*	.05	-.24	-.09 [†]	.05	-.20	-.02	.07	-.03	-.04	.06	-.07
Family income	.00	.00	.10	.00	.00	.09	.00 [†]	.00	.17	.00*	.00	.19
Parents' job prestige	.01	.01	.04	.01	.01	.03	-.01	.01	-.06	-.01	.01	.05
Age spacing	-.01	.03	-.03	.01	.03	.04	-.11*	.05	-.22	-.14*	.04	-.27
Older siblings' residential status	-.24	.23	.09	-.25	.22	-.10	.06	.31	.02	.08	.30	.02
Sex composition (SC)	-.03	.12	-.02	-.32*	.13	-.22	-.03	.16	-.02	.37*	.18	.19
Differentiation (Diff)	-.09	.08	.09	-.24*	.12	.24	.16	.11	.12	.34*	.16	.25
Diff ²	.14*	.07	.17	-.10	.09	-.12	.21*	.09	.18	.53**	.12	.47
Diff X SC				.21	.16	.15				-.22	.21	-.12
Diff ² X SC				.54**	.13	.45				-.75**	.18	-.46
R ²		.09			.19			.09			.19	
F for change in R ²		1.82 [†]			7.38**			1.86*			8.63**	

[†] $p < .10$.

* $p < .05$.

** $p < .01$.

Table 3
Summary of Hierarchical Regression Models Predicting Siblings' Temporal Involvement as a Function of Sibling Differentiation Polynomials, Sex Constellation, and Differentiation X Sex Constellation Interactions (N = 136)

Variable	Model 1			Model 2		
	B	SE B	β	B	SE B	β
Intercept	564.18**	44.87		593.94**	46.94	
Parents' education	-9.44	23.95	-.04	-5.45	23.72	-.02
Family income	-.00	.00	-.10	-.00	.00	-.10
Parents' job prestige	.00	3.30	.00	-.18	3.25	-.01
Age spacing	-55.73**	16.87	-.30	-49.68**	16.82	-.26
Older siblings' residential status	-235.44*	106.92	-.19	-249.50*	105.81	-.21
Sex composition	-148.72*	57.78	-.21	-223.93**	67.36	-.31
Differentiation	79.08*	38.30	.17	87.33	56.26	.18
Differentiation ²	12.07	32.07	.03	-41.46	41.71	-.11
Differentiation X Sex composition				-49.15	77.01	-.07
Differentiation ² X Sex composition				145.60*	64.67	.25
R^2		.23			.26	
F for change in R^2		4.70**			3.02*	

[†] $p < .10$.

* $p < .05$.

** $p < .01$.

Table 4
Partial Correlations Between Younger Siblings' Reports of Differentiation and Social Learning and Differences Between Older and Younger Siblings' Characteristics Controlling for Parents' Education, Job Prestige, and Family Income

Sibling Differences	Differentiation	Social Learning
Risky Behaviors ($N = 134$)	.17*	-.17*
Attitudes about Smoking ($N = 149$)	.17*	-.10
Attitudes about Drinking ($N = 149$)	.18*	-.11
School Bonding ($N = 147$)	.08	-.14 [†]
Commitment to Learning ($N = 149$)	.28**	-.23**
Social Competence ($N = 149$)	.24**	-.17*

Note: Absolute values of differences between older and younger siblings' reports of their individual characteristics.

[†]
 $p < .10$.

*
 $p < .05$.

**
 $p < .01$.